Preparation Guidelines

for

Submitting Plans to

Utah Department of Transportation

For the Purposes of Publishing to the Online

Electronic Plan Room

Revised October 20, 2004

Introduction

UDOT utilizes a system whereby plans and documentation for projects pending advertisement may be retrieved via the Internet using the *Internet Explorer* web browser.

For the purposes of this document, this system will be referred to as the *Electronic Plan Room*, or "EPR" for short.

The mechanism for publishing plan sets into this system is part of UDOT's production plotting software, *InterPlot*, commonly referred to as "iPlot", from Bentley Systems, Inc., who also provides our CADD software *MicroStation* and *InRoads*.

Most UDOT engineering personnel are familiar with the use of iPlot's *Organizer*, which can be used to create a batch of plan sheets to be plotted at one time, and this is the component used to publish a complete set of CADD drawings for a specific project into the EPR. However, certain procedures must be observed to ensure a smooth transition of the project plan sets into the EPR, and these will be discussed here.

Consulting firms must also prepare to deal with these issues. As is already required, the projects must be delivered to UDOT on CD's in the established project directory structure, including all information required to produce plots via the *iPlot Organizer* software. This includes all reference files, font and linestyle resource files. Note that the standard UDOT border files have in them a certain shape which *iPlot Organizer* recognizes to define the area to be plotted such that it registers correctly on the 11x17 page size.

One key element required for submittal is the *iPlot Organizer* plot-set file, *filename.ips*. The remainder of this document will serve to describe the requirements and procedures for preparing this file. Note that at one point the plot names in the *Organizer* must be renamed and ordered according to the UDOT document *Plan Sheet Codes and Descriptions*, which can be obtained from the UDOT website here:

http://www.udot.utah.gov/download.php/tid=739/PlanSheetCodes.pdf

InterPlot Software Configuration

In order for the *iPlot Organizer* application to properly render CADD drawings, either in hard-copy form or in the EPR, and with a minimum of intervention during the above steps, UDOT has developed the following method for launching the application. Note that the files mentioned are project-specific, and that with the exception of the UCF & PCF, these files reside in the project's /resources/iParm folder.

- A batch file (nnnnn_yy_Iplot.bat) starts the process and specifies which project configuration file (PCF) to use. It also contains several key iPlot variables, one of which specifies which iPlot settings file (.set) to use.
- The default user configuration file (dfltuser.cfg) resides in the *MicroStation* installation folder on the workstation and specifies the current username by way of an environment variable that equates to the current user's logon-id. This value is used by both *MicroStation* and *iPlot Organizer*.
- The user configuration file (username.ucf) resides in the user's workspace and contains several configuration variables, one of which instructs both *MicroStation* and *iPlot Organizer* where to look for the project configuration file.
- The project configuration file (nnnnn_yy.pcf) resides in the project's /Resources/Applications folder, and contains several variables that direct both *MicroStation* and *iPlot Organizer* to use specific resources, including linestyles, fonts, reference files, etc., and also several key iPlot variables. Note that the presence of these iPlot variables in the PCF allows the iPlot Dialog interface (accessed from within a MicroStation session) to function similarly to the *iPlot Organizer* application. A copy of this PCF must reside in the user's MicroStation workspace, and it is this copy that is actually processed by the *iPlot Organizer*.

- The iPlot settings file (iPlot.set) contains initial settings for processing CADD files either individually or as groups. This is very useful for automating the process of setting all parameters to produce correct plots. This specifies, among other things, the pen table, color table and plot-area (a rectangle indicating what area to plot – resides on the border drawings). The *location* and *name* of this file are specified in the iPlot variables within both the *iPlot Organizer* launching batch file and the PCF.
- The pen table (Udot.pen) controls, among other things, the thickness of lines based on their MicroStation "weights" and gray-scaling of some information. The *location* of this file is specified in the iPlot variables within both the *iPlot Organizer* launching batch file and the PCF. The *name* of this file is specified in the iPlot settings file.
- The batch file also executes a registration-entry file (iplotorg.reg) which directs *iPlot Organizer* where to start looking for files to add. This is not necessary, but only a convenience.

Allowable File Types for Iplot

- MicroStation DGN Files (*.dgn)
- IPARM Files (*.i)
- AutoCAD DWG Files (*.dwg)
- APARM Files (*.apm)
- JPEG – JFIF Compliant (*.jpg)
- TIF – Tagged Image File Format (*.tif)
- CALS – G4 Compliant (*.cal)
- Intergraph Raster (*.ims;*.cit;*.cot;*.crl;*.rgb;*.rle;*.tg4)
- RPARM Files (*.rpm)
- TGA – Truevision Targa (*.tga)
- PCX – Zsoft Paintbrush (*.bmp;*.pcx)
- InterPlot Digital Print Archive (*.dpr)
- DPARM Files (*.dpm)

Problems Frequently Encountered

- Printable area changes
  - Print drivers vary
  - Form name changes (11x17 vs. Tabloid)
- Resource mapping not same as project resource file
- Missing reference files
  - Base file created in non standard directory (not in search path)
  - Correct iplot.cfg file active
  - Setting save full path in reference manager
  - Referencing a temporary file that is deleted
- Compiling project data – Project directory containing files from all disciplines
  - All disciplines need to use same base files and file naming convention
  - All disciplines need to use same resource files (seed, line styles, etc.)
  - All disciplines use same directory structure and base project name (1843_01 vs. 1843_02)
- File changed in MicroStation but not updated in InterPlot Organizer
  - Levels turned on or off
  - Reference files attached or detached
  - View attributes changed
  - Border location moved
- Elements placed in drawing not showing in Iplot
  - Iplot.set file turns off levels 61-63
  - Iplot.set file does not display construction elements, enter data fields, reference boundaries, or text nodes
  - Elements placed on elevations outside of saved display depth

- Print area not found
    - Non standard border used
        - Iplot default looks for shape on level 61, color 44, weight 0, line style 0
    - Border reference detached or missing

Local Government – AutoCad Submittal Requirements

Provide:

- Pen assignments and printing instructions
- All files used to create sheet files
    - Xrefs
    - Text fonts (*.shx, *.ttf, etc.)
- If standard file naming convention not used, provide description of files
- Strip full paths or switch full paths to relative paths. Provide list of required directories to be included in search path.

Iplot Limitations With AutoCAD Support

InterPlot Client/Professional provides extensive AutoCAD Release 10 through 2000 support, including support for hatch entities, lwpolyline entities, application-defined proxy entities, AutoCAD project search paths, and TrueType font display.
InterPlot has a few limitations with regard to plotting AutoCAD drawing files:

- No support for AutoCAD display order. You can work around this issue by using InterPlot's priority resymbolization feature (through the use of pen tables). Refer to the on-line InterPlot Reference help for more information on how to use pen tables.
- Partial support for xref clipping. Clipping in plan views is supported. Non-view-aligned xref clip boundaries in 3D views are not supported.
- Quicktext mode inside MTEXT entities is not supported.
- Plotting of hidden-line or shaded views is not supported.
- Negative DIMGAP values for leader entities are not supported.

Creating a Plot Set

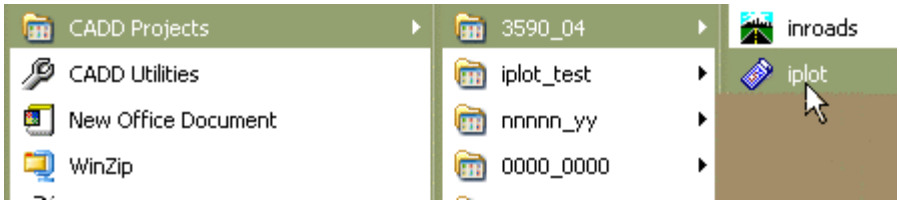
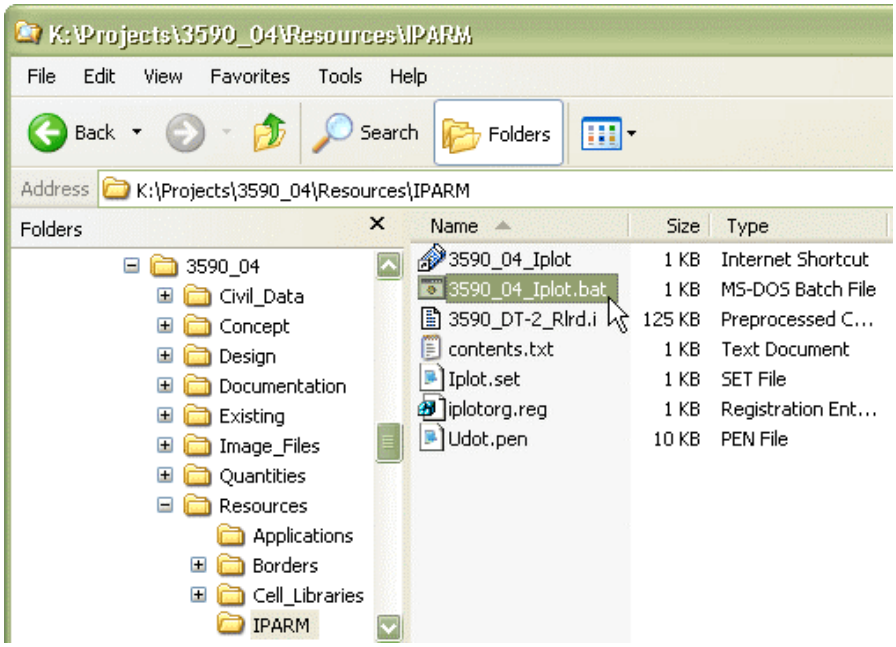


Figure 1 - Start InterPlot Organizer.
InterPlot Organizer should always be launched from the batch file created by the CADD Utilities program.



This batch file initializes project-specific configuration variables that control various important aspects of the program.

Within UDOT, this batch file is executed via a shortcut on the workstation's Start Menu, or the batch file can be executed directly from its location in the project's /resources/iParm folder.

The top figure shows a typical start-menu scenario, the bottom to execute batch file directly from the project's folder.

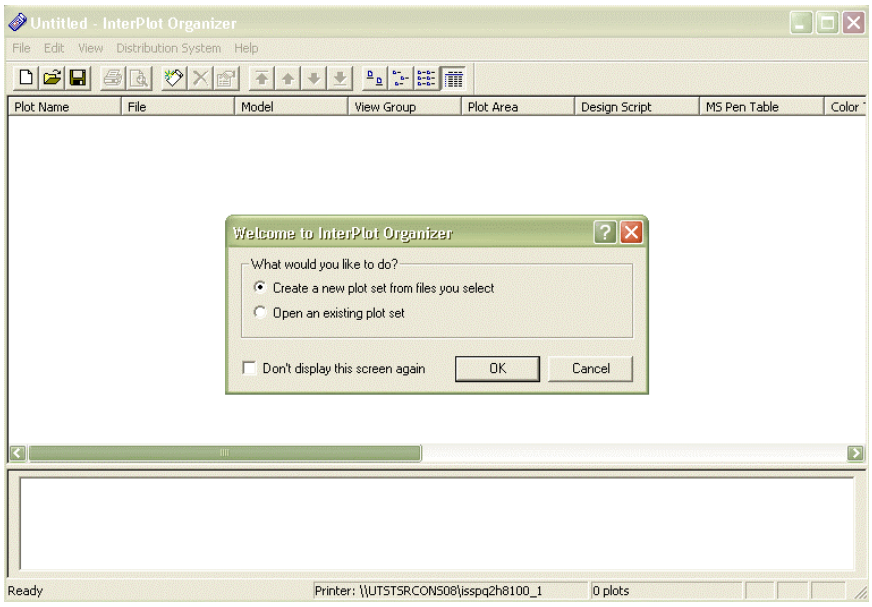


Figure 2 – Create or open a plot set.
Once InterPlot Organizer has loaded, ensure that the correct printer has been selected as shown on the bottom status line. If not, go to the menu and select File/Print Setup to select the appropriate printer.

For best results, choose a printer that supports 11x17.

Select from the pull-down menu "File/Create Plots" to create a new plot set or "File/Open" to open a previously created plot set.

Note that, depending on your iPlot settings, you may see a dialog box as shown, allowing you to either create a new or open an existing plot set. If so, and if you do not need to change your printer, you can use that dialog as opposed to the pull-down menu.

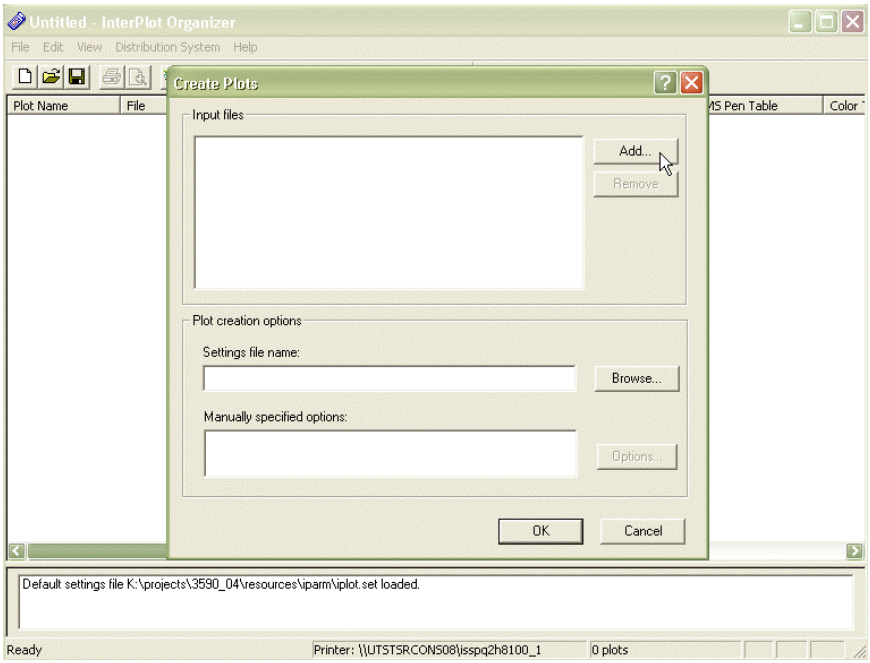


Figure 3 – Add files to plot set.
Verify that the correct settings file is being used, as displayed in the message area of the main window. If not, you can re-specify in the Settings File name near the middle of the Create Plots dialog, by using the Browse button.

Click on Add… to start selecting files to add to the plot set.

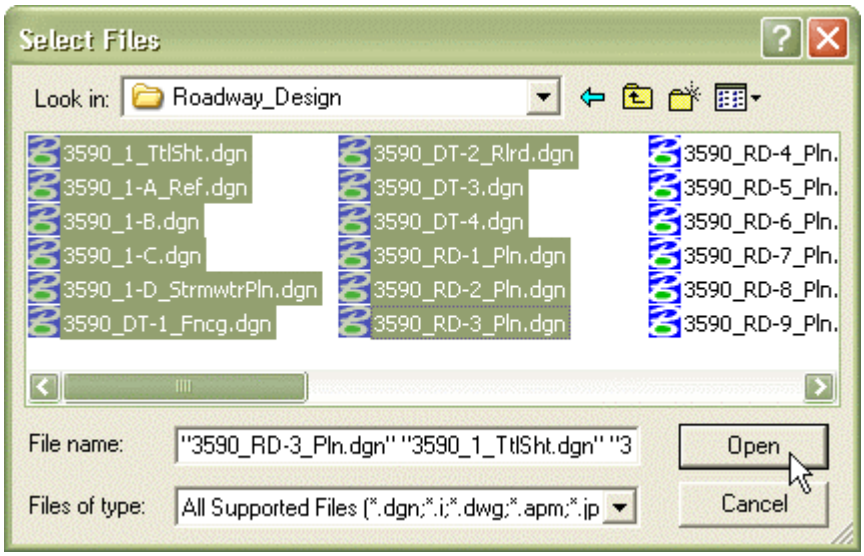


Figure 4 - Select files.
Select the files to include in the plot set and click on Open. Repeat for files in each subdirectory. Select as many as needed. You can always come back and add more at a later time.

After selecting files, they will appear in the "Files to plot" area on the "Create Plots" dialog. Click the OK button to commit the files to the plot set.

Note that files can be added in groups, and at any time. You do not need to add all files in one session.

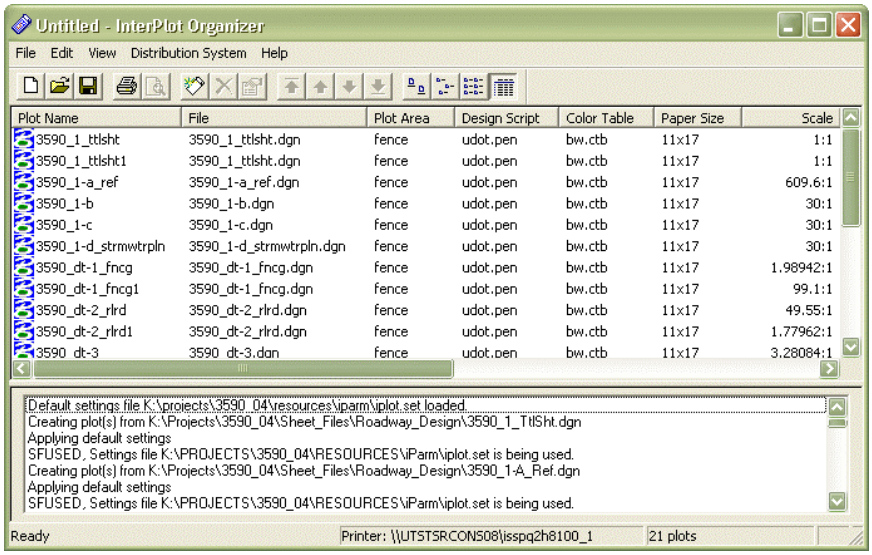


Figure 5 – Check Plot Set.
Scroll through the message area to check for errors from missing files or ignored area qualifiers. Check the Pen Table, Color Table, Paper Size, Scale and other columns to verify the correct parameters.

It is extremely important that this phase of processing the individual plan sheets goes through with no errors, since most errors will result in a less-than-perfect final rendition of the plan sheet, either in printed form or in the EPR. Take whatever steps are necessary to achieve an error-free process. If problems arise, please see the section titled "Problems Frequently Encountered" elsewhere in this document.

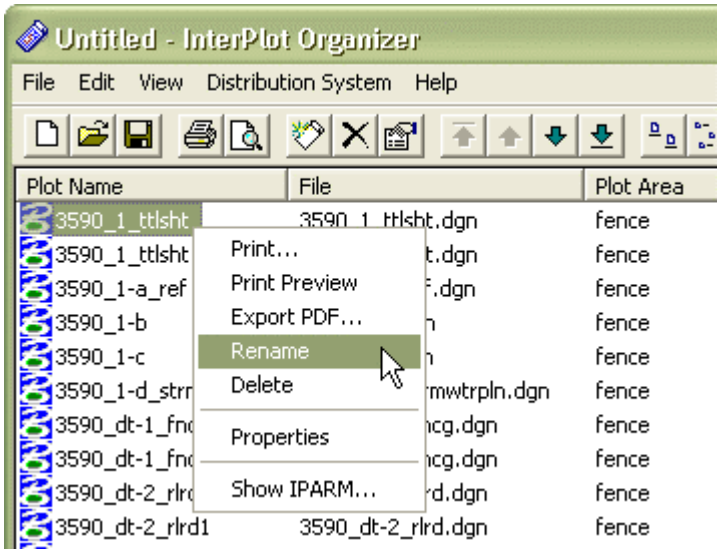


Figure 6 – Rename plot names.
Rename plot names to correspond with naming conventions defined in the UDOT document "Plan Sheet Codes and Descriptions". This may be obtained from the UDOT website. See introduction above for the address.

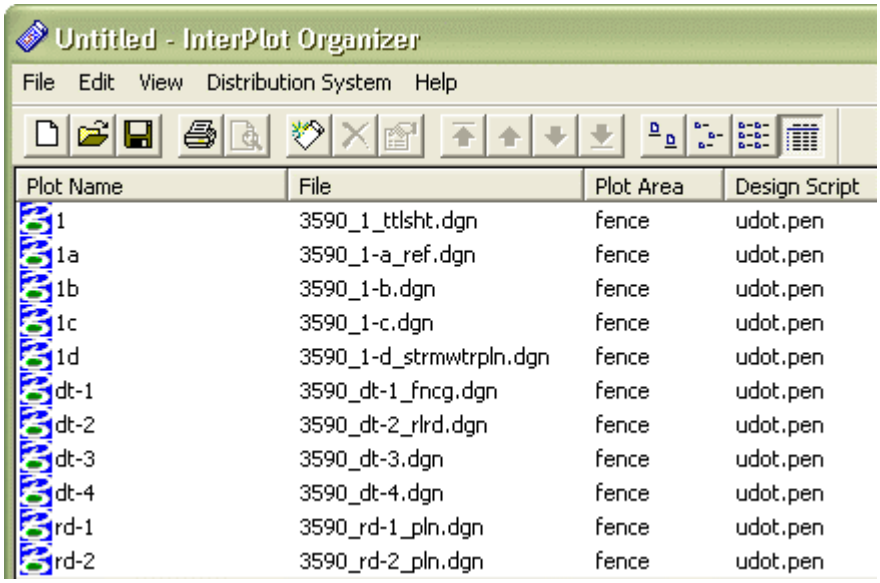


Figure 7 – Organize Sheets.
Put the sheet files in the order indexed defined in the UDOT document "Plan Sheet Codes and Descriptions" mentioned in figure 6. Use the arrows at the top of the program to move selected files up or down.

The idea here is to have the Plot Names column correspond to the actual plan set, with each plot appropriately named and in the correct order. This will ensure that the published plan set on the EPR will be organized exactly as it would in a hard-copy plan set.

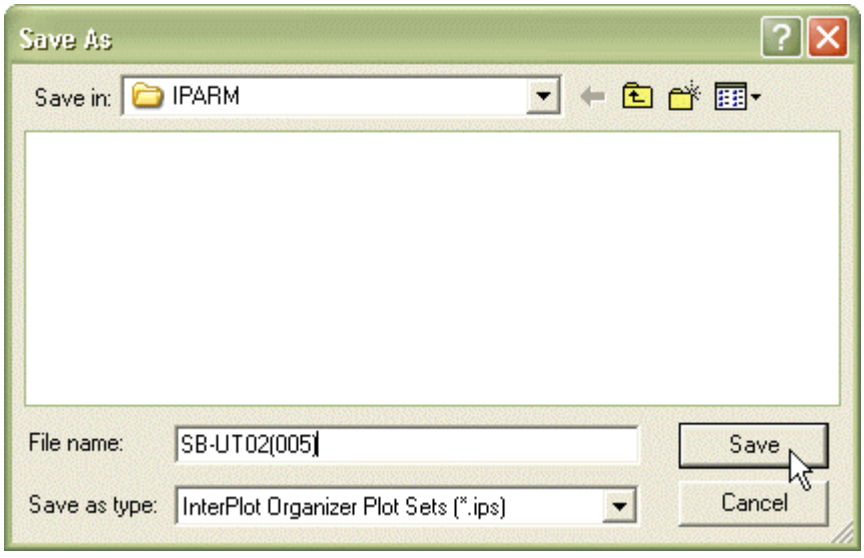


Figure 8 – Save the Plot Set.
After all required files, including all structure sheets, have been added, save the plot set using the project number as the name.

Note that it is no longer necessary to provide two sets, one with structure drawings and one without. The Construction Division staff will take care of producing the "public" and "contractor" sets from the full set you provide.

It is recommended that the plot set be printed in hard-copy form to ensure that each sheet will appear correctly, with correct orientation on the sheet and correct symbology, including fonts, linestyles and line weights. Again, take whatever steps are necessary to achieve an error-free process.